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ABSTRACT

As part of the work from the Content Area Reading Project (CARP), which focuses on inservice teacher education in content area reading, a study examined the effects of an inservice content area reading program reflecting the CARP model on student reading and study skills achievement. The study also compared the uses of norm-referenced tests versus criterion-referenced tests in measuring reading and study skills achievement. Subjects were fourth, fifth, eighth, and ninth grade students of teachers who participated in the monthly inservice workshops on content area reading strategies (the experimental group) and of teachers who had not participated in the inservice project but who matched as closely as possible the project teachers (the comparison group). A measure of general reading ability, the Work-Study Skills subtest of the Iowa Tests of Basic Skills (norm-referenced), and selected subtests of the Wisconsin Tests of Reading Skills Development (criterion-referenced) were the instruments used in the study. No definite pattern of significant differences was established from class to class in the analysis of the data, a result that might be due to the lack of emphasis on reading and study skills in the inservice courses or to the urging of teachers in the program to be resource persons and to share ideas with colleagues (the comparison group teachers). The findings favored neither the norm-referenced tests nor the criterion-referenced tests, although the criterion-referenced test had more subtests to indicate specific areas of reading skill. (RL)

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Study Skills: Impact of a Teacher Inservice Program on Student Achievement*

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Content area reading has received renewed attention as one of the major topics in the field of reading within the last two decades. This focus on reading/study skills is the result of the recognition that the acquisition of reading skills--learning to read in developmental reading classes--does not insure the transfer of these skills to content materials (Fisher, 1974).

Many teachers are aware that poor achievement in content subjects can be related to the difficulty students experience in reading content material. Karlin (1972) suggested that one contributor to failures is the inability of students to cope with the increasing reading demands made of them. Concerning the high school dropout problem, Rubin (1974) identified the lack of reading skills necessary for success in content classes as one of the most important factors underlying the problem. Singer (1972) also noted that the frustration experienced by intelligent students who are embarrassed because of achievement deficiencies, especially in reading, may cause them to leave school.

*Note: This paper is one of three presented at the second annual conference of the American Reading Forum.

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School personnel often analyze the scores from the customarily given standardized tests to ascertain the needs of the students. Schleich (1971) found that the scores on a standardized reading test administered as part of a school-wide program showed a significant downward trend from grades nine to twelve for the same group of students. This assessment was conducted prior to the implementation of a content area reading course for the teachers. It seemed to indicate that the higher level reading skills were not being developed.

Diem (1980) noted the dramatic decline of reading and content scores for one school dictrict's students in grades four through twelve. This finding prompted an investigation into curricular problems, and it became apparent that the academic achievement in the content areas was being affected by low reading performance.

A number of programs have been developed to educate content teachers in devising and implementing reading strategies as a part of the courses they teach. Some of these programs are becoming part of the required curriculum for preservice teachers in an attempt to improve the preparation of these future teachers for the needs of students. Others are designed specifically for inservice teachers whose content training included little, if any, course work in the teaching of reading.

Teacher training is a necessary step for improving instruction. However, the effectiveness of a content area reading program is ultimately determined by the students' abilities to use those reading skills for the improvement of achievement in the content areas.

Lee (1977) examined the effects of a competency-based content area reading inservice program on the attitudes and knowledge of reading skills of participating teachers. The exclusion of an assessment of student

achievement was cited as a limitation of the study. The reason given for excluding this area as part of the evaluation for the inservice program was that it seemed unrealistic to expect significant gains in academic achievement as the result of teacher participation in an inservice program, especially when the focus of that program is centered on measuring teacher variables related to reading instruction. The measurement of student achievement was recommended for future research because of its importance as a variable in teacher education can not be overlooked.

A program designed to improve the attitudes and skills of teachers for integrating reading skills in the content areas should eventually have a positive effect on student achievement. However, the teachers involved in content area reading programs are implementing novel strategies, sometimes under observation, in situations of learning for the teachers. Although these programs are designed to give the participants time to internalize and practice the new ideas, the teachers are not able to effect an overall sequential plan of reading instruction which could be applied to their classes. The evaluation of an inservice program in terms of student achievement might be addressed more effectively in a planned follow-up study to a teacher inservice program.

This investigation was conducted to examine the effects of a competency-based content area reading project for inservice teachers on the reading/study skills achievement of students. The teachers who participated in the project completed the requirements for the inservice course during the 1979-80 school year, a full year prior to this investigation.*

This study also examined the influence of the type of assessment instru-

*Note: The second paper in this series discusses the teacher data collected in this project.

ment used to measure reading/study skills achievement for the evaluation of the teacher inservice project. The subjects of the study were given criterion-referenced and norm-referenced tests.

The following hypotheses were proposed for this study:

1. There will be no significant differences in the reading/study skills achievement scores of students taught by the content area project teachers and students taught by teachers who did not participate in the project, as measured by the criterion-referenced test.

2. There will be no significant differences in the reading/study skills achievement scores of students taught by the content area project teachers and students taught by teachers who did not participate in the project, as measured by the norm-referenced test.

3. There will be no significant differences in the number of students who attain mastery level (75%) or better on the criterion-referenced test for the groups of students taught by the content area reading project teachers and those taught by teachers who did not participate in the project.

For the purpose of this investigation, reading/study skills are defined as map skills, graph and table skills, and reference skills (Kamm, 1971).

Method

Subjects

The subjects of this study were selected from students in grades four, five, eight, and nine of the Hollidaysburg Area School District which is located in west central Pennsylvania.

The experimental group subjects were students in the classes of teachers who participated in the first year of the content area reading project. Twenty five teachers were initially involved in the project. One year later,

however, some of the teachers had been granted leaves, made radical changes in grades taught, or moved from the district. Four of the remaining project teachers were reading specialists and not responsible for content area courses. Thus, six of the original project teachers, three elementary and three junior high, were identified and their students became the subjects of the experimental groups.

The comparison group subjects were the students of teachers who matched, as closely as possible, the project teachers on the following criteria: subject taught, grade placement, high or low achievement class, and years of teaching experience. These teachers had not participated in a content area reading course.

Procedures

Some researchers have suggested that standardized measures of general reading ability are not sensitive enough to distinguish isolated skill improvements that could be attributed to a relatively short treatment period (Jensen, 1976; Peters, Peters, and Kaufman, 1975; Singer, 1976). For this reason, only the reading/study skills achievement of the subjects will be assessed.

No attempt was made to alter the regular class assignments of students to teachers that the district normally followed. All students in the same grade are ranked by reading achievement score. The ranks are then divided into two groups from which they are then randomly assigned to teachers for the classes they need. Because of this procedure intact classes were used and the groups were compared separately for the teachers who were matched. The six classifications for the matched teacher groups were:

Elementary: fourth grade social studies, fifth grade science, fifth grade social studies

Junior high: eighth grade English, eighth grade history, ninth grade math

Instruments. The Comprehensive Tests of Basic Skills (CTBS) were administered to the subjects of this study as part of the regular testing program of the school district in the spring of 1980. The reading subtest of the CTBS was used as a measure of general reading ability.

In the spring of 1981 the subjects were given the Work-Study Skills subtests of the Iowa Tests of Basic Skills (ITBS), a norm-referenced test and selected subtests of the Wisconsin Tests of Reading Skills Development: Study Skills (WTRSD), a criterion-referenced test, as measures of reading/study skills achievement.

Analysis of Data

A t-test was performed on the mean CTBS grade equivalent scores of the matched teacher groups of students. The data indicated no significant differences in the general reading scores for all classifications except the eighth grade English sections. The experimental group showed a higher significant mean, $t(39) = 2.69$, $p < .05$.

The data were analyzed separately for each of the subtests and the total test of the ITBS and the WTRSD per matched teacher groups with an analysis of covariance. The raw scores on these tests were adjusted to control for general reading ablity, using the CTBS as the covariate, in order to determine if significant differences existed in the reading/study skills scores of the groups of students.

The fourth grade comparison group scored significantly higher on the reference materials subtests of the ITBS, $F(1.51) = 5.18$, $p < .05$. The same group also scored significantly higher on two of the six subtests and the total test of the WTRSD: maps--intermediate directions, $F(1,51) = 6.67$,

$p < .01$; indexes, $F(1,51) = 8.01$, $p < .01$; total test, $F(1,51) = 4.51$, $p < .05$. No significant differences were found for either of the fifth grade classes on any of the subtests or the total test.

The eighth grade English experimental group scored significantly higher on all sections of the ITBS: visual materials, $F(1,37) = 4.91$, $p < .05$; reference materials, $F(1,37) = 15.84$, $p < .001$; total test, $F(1,37) = 12.19$, $p < .001$. On the WTRSD the eighth grade English experimental group scored significantly higher on one of the five subtests given and the total test: graphs--multiplicative differences, $F(1,37) = 9.36$, $p < .01$; total test, $F(1,37) = 13.15$, $p < .001$. The comparison group for ninth grade math scored significantly higher on the schedules--problem solving subtest of the WTRSD, $F(1,40) = 5.69$, $p < .05$.

The Chi square test was used to analyze the data according to mastery versus non-mastery on each of the subtests and the total test of the WTRSD for each of the teacher matched groups of students. Significant differences were obtained for the fifth grade science groups for the subtest on dictionary meanings, $\chi^2 = 10.76$, df = 1, $p < .001$ and the total test, $\chi^2 = 4.51$, df = 1, $p < .05$. The fifth grade social studies groups differed significantly on the point, line, and area symbols subtest, $\chi^2 = 5.38$, df = 1, $p < .05$. No significant differences were found between the fourth grade groups on any of the subtests or the total test.

At the junior high level significant differences were shown for the eighth grade English groups on all but one of the subtests: maps--synthesis, $\chi^2 = 7.65$, df = 1, $p < .01$; graphs--multiplicative differences, $\chi^2 = 9.16$, df = 1, $p < .01$; graphs--projecting and relating, $\chi^2 = 4.54$, df = 1, $p < .05$; schedules--problem solving, $\chi^2 = 6.67$, df = 1, $p < .01$; and the total test, $\chi^2 = 9.01$, df = 1, $p < .01$. No significant differences were found between the

eighth grade history or the ninth grade math groups. Generally, there were more students in the non-mastery category for the latter two groups. On three of the subtests none of these students attained mastery.

Discussion

The findings of this study do not favor either the norm-referenced nor the criterion-referenced test for evaluating a teacher inservice program in terms of student achievement. The same groups showed significant differences for the same general skills (maps, graphs and tables, and references) regardless of the type of test. However, the criterion-referenced test had more subtests to indicate specific areas where significant differences were obtained. Also, assessing mastery can provide more direct information as to how well students (as a group) are achieving. This is especially necessary when the results of mean differences are not significant because there is no distinction as to whether the students (again, as a group) are achieving the goals set before them or not, just that the groups do not differ.

Since only one group at each level showed significant differences on more than one subtest of either type of test, no definite pattern of significant differences was established from class to class in the elementary or junior high setting. One possible reason for this could be that reading/study skills are not emphasized as much as other areas of reading instruction. The content area reading courses for teachers usually introduce strategies for developing vocabulary and comprehension before reading/study skills possibly causing teachers to infer, incorrectly, a hierarchy inherent in these categories. Morrison (1980) found that some content area teachers did not consider the reading/study skills as important as other reading skills for their content areas. This could account for the low number of students who attained mastery in the eighth grade history and ninth grade math classes.

Future research should be directed at a comparison of achievement levels of students in regard to the various aspects of reading skills as they apply to particular content areas with the amount of instructional time provided for each aspect.

One aim of the original content area reading project was to have teachers become resource persons for other teachers in the district as part of an ongoing inservice program. It seems that the 'sharing' attitude of teachers, especially on the elementary level, may account for the lack of significant differences between the groups in those classes. Some students in all of the elementary classes attained mastery on all of the reading/study skills assessed as opposed to the groups in two classes of the junior high students in which no one attained mastery on certain skills. Teachers who are encouraged to participate in providing inservice for other teachers can facilitate changes in instructional procedures which will benefit the learners.

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